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10/551,408	02/24/2006	Yoshihiro Ito	0760-0350PUS1	4487
2292 7590 03/09/2009 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
BASS, DIRK R				
ART UNIT		PAPER NUMBER		
1797				
NOTIFICATION DATE		DELIVERY MODE		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

# Office Action Summary

Application No.

10/551,408

Applicant(s)

ITO ET AL.

Examiner

DIRK BASS

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-26 (claims 2-11: renumbered to claims 27-36) is/are pending in the application.
- 4a) Of the above claim(s) 1-11, 15-22 and 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-14, 23-24, 26, and 27-36 (renumbered from original cl. 2-11) is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 29 Sept. 2005, 4 April 2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction is required under 35 U.S.C. 121 and 372. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

2. In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-11 and 16-22, drawn to an agent for fixing a substance.

Group II, claim(s) 12-14 and 23-24, drawn to a method for fixing a substance.

Group III, claim(s) 15 and 25, drawn to a substrate.

3. The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the common technical feature, i.e. using functionalized polymers to bind biological substances, is known in the prior art as evidenced by Duran et al., US 5858653. Duran ('653) discloses methods and compositions for fixing substances (see abstract) comprising water-soluble polymers and photoreactive groups (see col. 2, l. 61-67), thus the common technical feature, using functionalized polymers to bind biological substances, of the claimed invention is not found to define a contribution over the prior art.

4. During a telephone conversation with Richard Gallagher on 6 February 2009 a provisional election was made without traverse to prosecute the invention

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of group II, claims 12-14 and 23-24. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-11, 15-22, and 25 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

6. The preliminary amendment, filed 6 February 2009, after election of group II above has been acknowledged.

### ***Claim Objections***

7. A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

Claims 2-11, amended to further limit method claim 12 are improper for failing to refer to a preceding claim. For the purposes of examination, the examiner is interpreting these claims to be dependant upon claim 12 and to also be renumbered after newly added claim 26.

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 2-11 have been **renumbered 27-36** respectively.

8. Claims 32 and 35 (renumbered) are objected to because of the following informalities: claims 32 and 35 state a "method..., which is represented by". For the purposes of examination, the examiner is interpreting claim 32 to mean a method comprising a unit represented by the general formula [III] and claim 35 to mean a method comprising a unit represented by the general formula [IV]. Appropriate correction is required.

#### **Duplicate Claim**

9. Applicant is advised that should claim 13 be found allowable, claim 36(renumbered, original claim 11) will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 112***

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 27, 32, and 35(renumbered, original claims 2, 7 and 10) are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear whether the wherein clause following the parenthesis is intended to further limit the claim.

12. Claim 30(renumbered, original cl. 5) is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear which unit of measurement the polymer is being weighed. For the purposes of examination, the examiner is interpreting the molecular weight of said polymer to be in units of Daltons.

13. Claims 34-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 34 recites the limitation "formula [I]" in line 2 of claim 35. There is insufficient antecedent basis for this limitation in the claim. For the purposes of examination, the examiner is interpreting claim 34 to be dependant upon claim 27 rather than claim 33.

***Claim Rejections - 35 USC § 102***

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. **Claims 12-14, 23-24, 26, 28, 30-31, and 36 are rejected under 35**

**U.S.C. 102(b) as being clearly anticipated by Yan et al., US 5830539.**

Regarding claim 12, Yan ('539) discloses a method for fixing a substance on a substrate (see abstract) comprising:

a. Coating a substrate with a solution containing said substance to be fixed on said substrate (see "functionalizing group", col. 4, l. 4-16) and an agent for fixing a substance (see "functionalizing reagent", col. 3, l. 14-26, and col. 4, l. 4-11) comprising:

i. A water-soluble polymer used for fixing a desired substance on a substrate (col. 14, l. 31-43), which water-soluble polymer has at least two photoreactive groups in one molecule (see "functionalizing reagent", col. 3, l. 14-26 and l. 30-39), said molecule of said water-soluble polymer being electrically neutral as a whole;

b. Irradiating said solution or suspension with light (see "reaction-energy source", col. 10, l. 49-56 and col. 15, l. 25-36).

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Regarding claim 13, Yan ('539) discloses a method, wherein said substance to be fixed on said substrate is nucleic acid (col. 4, l. 11-15).

Regarding claim 14, Yan ('539) discloses a method comprising selectively radiating said light so as to pattern the region to which said substance is fixed (col. 22, l. 60-64).

Regarding claim 23, Yan ('539) is relied upon in the rejection of claim 12 above. Yan ('539) further discloses a nonionic water-soluble polymer macromolecule (see "poly methylmethacrylate", col. 14, l. 41-42).

Regarding claim 24, Yan ('539) is relied upon in the rejection of claim 13 above.

Regarding claim 26, Yan ('539) discloses a process of producing a substrate on which desired substances are fixed (see abstract) comprising:

Coating a substrate with a solution containing said substance to be fixed on said substrate (see "functionalizing group", col. 4, l. 4-16) and an agent for fixing a substance (see "functionalizing reagent", col. 3, l. 14-26, and col. 4, l. 4-11) comprising:

A water-soluble polymer used for fixing a desired substance on a substrate (col. 14, l. 31-43), which water-soluble polymer has at least two photoreactive groups in one molecule (see "functionalizing reagent", col. 3, l. 14-26 and l. 30-39), said molecule of said water-soluble polymer being electrically neutral as a whole;

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Irradiating said solution or suspension with light (see "reaction-energy source", col. 10, l. 49-56 and col. 15, l. 25-36).

Regarding claim 28, Yan ('539) discloses a method wherein said photoreactive group is an azide group (see "perfluorophenyl azides", col. 4, l. 47-50).

Regarding claim 30, Yan ('539) discloses a method wherein said polymer has a molecular weight of 1000 to 1,000,000 (col. 31, l. 18-20).

Regarding claim 31, Yan ('539) discloses a method wherein said X and Y are derived from vinyl monomers (see "polyvinyl chloride", col. 14, l. 31-38).

Regarding claim 32, Yan ('539) discloses a method comprising a unit having the structure represented by general formula [III] (see "poly methylmethacrylate" col. 14, l. 31-43, "2-methacryloyloxyethyl phosphorylcholine" col. 48, l. 15-25, and "perfluorophenyl azide" col. 4, l. 47-50). It is implicit in this structure that the polymeric substance contains at least 2 groups of X' and Y' and that X' and Y' are bound in random order.

Regarding claim 33, Yan ('539) discloses a method wherein said unit containing X' is derived from 2-methacryloyloxyethyl phosphorylcholine (col. 48, l. 15-25).

Regarding claim 34, Yan ('539) discloses a method wherein said unit represented by the general formula [I] is derived from 2-methacryloyloxyethyl phosphorylcholine (col. 48, l. 15-25).

Regarding claim 36, Yan ('539) is relied upon in the rejection of claim 13 as set forth above.

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**18. Claims 27, 29, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yan et al., US 5830539.**

Regarding claim 27, Yan ('539) is relied upon in the rejection of claim 12 as set forth above.

Yan ('539) further discloses a method for fixing a substance, comprising a unit having the structure represented by general formula [I] (see "poly methylmethacrylate", col. 14, l. 41-42, and "2-methacryloyloxyethyl phosphorylcholine (MPC)", col. 48, l. 15-25) and a unit having the structure represented by general formula [II] (see "poly methylmethacrylate", col. 14, l. 41-42, and "perfluorophenyl azides", col. 4, l. 47-50). Yan ('539) fails to disclose that

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the number of units represented by general formula [I] is larger than the number of units represented by general formula [II]. At the time of the invention, it would have been obvious to one skilled in the art to optimize the relative number of units represented by general formulas [I] and [II], since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art (see MPEP 2144.05, part II, section B).

Regarding claim 29, Yan ('539) is relied upon in the rejection of claim 27 above. Yan ('539) fails to disclose a method, wherein the ratio of units represented by general formula [I] to the number of units represented by general formula [II] is 100:2 to 100:50. At the time of the invention, it would have been obvious to one skilled in the art to optimize the relative number of units represented by general formulas [I] and [II], since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art (see MPEP 2144.05, part II, section B).

Regarding claim 35, Yan ('539) discloses a method comprising a polymeric substance (col. 14, l. 31-36) functionalized with 2-methacryloyloxyethyl phosphorylcholine (col. 48, l. 15-25) and perfluorophenyl azide (col. 4, l. 47-50). It is implicit in Yan ('539) that the functionalized groups are bound to the polymer in random order,  $n'$  represents an integer between 50 and 200, and  $m'$  represents an integer between 5 and 40. Yan ('539) fails to disclose a method comprising a polymeric substance functionalized with an azidophenyl group. At the time of the invention, it would have been obvious to one skilled in the art to substitute the perfluorophenyl group of Yan ('539) with an

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azidophenyl group because it is *prima facie* obvious to substitute known compounds when the chemical compounds have very close structural similarities and similar utilities.

### ***Conclusion***

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIRK BASS whose telephone number is (571) 270-7370. The examiner can normally be reached on Mon - Fri (9am-4pm).

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/DRB/

Dirk R. Bass

February 11, 2009

/Vickie Kim/

Supervisory Patent Examiner, Art Unit 4181

